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W claim:

1. A modified M2 polypeptide with reduced hydrophobicity and enhanced recombinant expression relative to a native M2, the modified M2 polypeptide comprising a sequence of amino acids identical to a native M2 protein in which the transmembrane region and from 0 to 12 amino acid residues adjacent to the transmembrane region on the C-terminal side have been deleted.

2. The modified M2 polypeptide of claim 1, wherein the transmembrane region and none of the adjacent residues on the C-terminus side of the transmembrane region have been deleted.

3. The modified M2 polypeptide of claim 1, wherein the transmembrane region and the adjacent 12 amino acids on the C-terminal side of the transmembrane region have been deleted.

4. The modified M2 polypeptide of claim 1, wherein the native M2 protein is from the A/Aichi/2/68 (H3N2) virus.

5. The modified M2 polypeptide of claim 4, wherein amino acids 26-43 have been deleted.

6. The modified M2 polypeptide of claim 4, wherein amino acids 26-55 have been deleted.

7. The modified M2 polypeptide of any one of claims 1 to 6, wherein the deleted amino acid residues are replaced one or more neutral or hydrophilic amino acid residues, provided that the total number of amino acid residues in the modified M2 polypeptide is less than or equal to the number in the native M2 polypeptide.

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8. The modified M2 polypeptide of claim 7, wherein all of the deleted amino acids are replaced with from one to six glycine residues.

9. A modified M2 polypeptide with reduced hydrophobicity and enhanced recombinant expression relative to a native M2, the modified M2 polypeptide comprising a sequence of amino acids identical to a native M2 protein in which from one to all of the amino acid residues of the transmembrane region and from 0 to 12 amino acid residues adjacent to the transmembrane region on the C-terminal side are replaced with neutral or hydrophilic amino acid residues.

10. The modified M2 polypeptide of claim 9, wherein all of the amino acid residues of the transmembrane region have been substituted with neutral or hydrophilic residues.

11. The modified M2 polypeptide of claim 9, wherein all of the amino acid residues of the transmembrane region and from one to twelve amino acids adjacent to the transmembrane region on the C-terminal side have been substituted with neutral or hydrophilic residues.

12. The modified M2 polypeptide of any one of claims 9 to 11, wherein the native M2 protein is from the A/Aichi/2/68 (H3N2) virus.

13. A modified M2 polypeptide fusion protein comprising a modified M2 polypeptide according to and one of claims 1 to 12.

14. A DNA molecule comprising a sequence of nucleotides encoding a modified M2 polypeptide according to any one of claims 1 to12.

15. A vector capable of expressing a modified M2 polypeptide, the vector comprising the DNA molecule of claim 14.

16. A host cell capable of expressing a modified M2 polypeptide, the host cell comprising a vector according to claim 15.

17. The host cell according to claim 16, wherein the host is a prokaryote.

18. The host cell according to claim 16, wherein the prokaryote is *E. coli*.

19. A composition comprising a modified M2 polypeptide of any one of claims 1 to 12 and a pharmaceutically acceptable carrier.

20. An antibody to a modified M2 polypeptide of any one of claims 1 to12.

21. A method of preventing or treating a subject suffering from viral influenza A infection, the method comprising administering a prophylactic or viral load-reducing amount of an antibody according to claim 20.

22. A method for determining current or previous exposure of a subject to influenza virus, the method comprising contacting a sample from the subject with a modified M2 protein according to any one of claims 1 to 12 and detecting the binding of antibodies to the modified M2 protein.

23. A method of preparing an M2 antibody, the method comprising immunization of a subject with a composition according to claim 19.